

Saponite Mineral Data

Saponite

Mineral Data



Pronunciation Guide



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General Saponite Information

☒ **Chemical Formula:** $(\text{Ca}/2, \text{Na})_{0.3}(\text{Mg}, \text{Fe}^{++})_3(\text{Si}, \text{Al})_4\text{O}_{10}(\text{OH})_2 \cdot 4(\text{H}_2\text{O})$

☒ **Composition:** Molecular Weight = 480.19 gm

Sodium	0.48 %	Na	0.65 %	Na ₂ O
Calcium	0.83 %	Ca	1.17 %	CaO
Magnesium	11.39 %	Mg	18.89 %	MgO
Aluminum	5.62 %	Al	10.62 %	Al ₂ O ₃
Iron	8.72 %	Fe	11.22 %	FeO
Silicon	17.55 %	Si	37.54 %	SiO ₂
Hydrogen	2.10 %	H	18.76 %	H ₂ O
Oxygen	53.31 %	O		

100.00 % 98.83 % = TOTAL OXIDE

☒ **Empirical Formula:** $\text{Ca}_{0.1}\text{Na}_{0.1}\text{Mg}_{2.25}\text{Fe}^{2+}_{0.75}\text{Si}_3\text{AlO}_{10}(\text{OH})_2 \cdot 4(\text{H}_2\text{O})$

☒ **Environment:** Amygdaloidal cavities in basalts.

☒ **IMA Status:** Valid Species (Pre-IMA)

☒ **Locality:** Lizard Head in Cornwall, England. [Link to MinDat.org Location Data.](#)

☒ **Name Origin:** From the Latin, sapo meaning "soap."

☒ **Synonym:** Griffithite-Ferroan
Piotine

Saponite Image

☒ **Images:**



Saponite

Comments: Light brown saponite pseudomorphs after stilbite crystals up to 6 mm.

Location: Thetford Mines, Mégantic Co., Québec, Canada. **Scale:** 25x25x12 mm.

© John H. Betts

Saponite Crystallography

☒ **Axial Ratios:** a:b:c = 0.5786:1:1.3537

☒ **Cell Dimensions:** a = 5.3, b = 9.16, c = 12.4, Z = 2; beta = 96.5° V = 598.13 Den
(Calc) = 2.67

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- ☒ **Crystal System:** **Monoclinic - Prismatic** H-M Symbol (2/m) Space Group: C 2/m
☒ **X Ray Diffraction:** By Intensity(I/I₀): 12.3(1), 1.53(0.7), 3.1(0.5),

Physical Properties of Saponite

- ☒ **Cleavage:** [001] Perfect
☒ **Color:** White, Yellowish white, Greenish white, Reddish white, Bluish white.
☒ **Density:** 2.3
☒ **Diaphaniety:** Subtranslucent to opaque
☒ **Fracture:** Earthy - Dull, clay-like fractures with no visible crystalline affinities, (e.g. howlite).
☒ **Habits:** Massive - Uniformly indistinguishable crystals forming large masses., Granular - Generally occurs as anhedral to subhedral crystals in matrix.
☒ **Hardness:** 1.5-2 - Talc-Gypsum
☒ **Luminescence:** None.
☒ **Luster:** Earthy (Dull)
☒ **Streak:** white

Optical Properties of Saponite

- ☒ **Gladstone-Dale:** $Cl_{meas} = 0.026$ (Excellent) - where the $Cl = (1 - KP_{Dmeas}/KC)$
 $Cl_{calc} = 0.161$ (Poor) - where the $Cl = (1 - KP_{Dcalc}/KC)$
 $KP_{Dcalc} = 0.1899, KP_{Dmeas} = 0.2204, KC = 0.2264$
☒ **Optical Data:** Biaxial (-), $a = 1.479-1.49$, $b = 1.51-1.525$, $g = 1.511-1.527$,
 $bire = 0.0320-0.0370$, $2V(Calc) = 20-26$, $2V(Meas) = 0-10$. Dispersion none.

Calculated Properties of Saponite

- ☒ **Electron Density:** $P_{electron} = 2.32 \text{ gm/cc}$
note: $P_{saponite} = 2.30 \text{ gm/cc}$.
☒ **Photoelectric:** $PE_{saponite} = 3.76 \text{ barns/electron}$
 $U = PE_{saponite} \times P_{electron} = 8.75 \text{ barns/cc}$.
☒ **Radioactivity:** $GRapi = 0$ (Gamma Ray American Petroleum Institute Units)

Saponite is **Not Radioactive**

Saponite Classification

- ☒ **Dana Class:** **71.3.1b.2 (71) Phyllosilicate Sheets of Six-Membered Rings (71.3) with 2:1 clays**
(71.3.1b) Smectite group (Trioctahedral Smectites)

71.3.1b.1 Sobokite $(K,Ca_0.5)O_{0.33}(Mg,Al)_3(Si_3Al)O_{10}(OH)_2 \cdot 1-5(H_2O)$ Unk. Mono
71.3.1b.2 Saponite $(Ca/2,Na)_0.3(Mg,Fe)_3(Si,Al)_4O_{10}(OH)_2 \cdot 4(H_2O)$ C 2/m 2/m
71.3.1b.3 Sauconite $Na_0.3Zn_3(Si,Al)_4O_{10}(OH)_2 \cdot 4(H_2O)$ C 2/m 2/m
71.3.1b.4 Heclorite $Na_0.3(Mg,Li)_3Si_4O_{10}(OH)_2$ C 2/m 2/m
71.3.1b.5 Pimelite* $Ni_3Si_4O_{10}(OH)_2 \cdot 4(H_2O)$ Unk. Hex
71.3.1b.6 Stevensite $(Ca_0.5,Na)_0.33(Mg,Fe)_3Si_4O_{10}(OH)_2 \cdot n(H_2O)$ Unk (ORTH ?) Mono
71.3.1b.7 Yakhontovite $(Ca,K)_0.5(Cu,Fe,Mg)_2Si_4O_{10}(OH)_2 \cdot 3(H_2O)$ C 2/m 2/m
71.3.1b.8 Zincsilite $Zn_3Si_4O_{10}(OH)_2 \cdot 4(H_2O)$ (?) C 2/m ? 2/m

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71.3.1b.9 IMA2002-0281 $\text{Ca}_0.3(\text{Fe,Mg,Fe})_3(\text{Si,Al})_4\text{O}_{10}(\text{OH})_2 \cdot 4\text{H}_2\text{O}$ C? Mono

☒ **Strunz Class:**

VIII/H.20-20 VIII - Silicates

VIII/H - Phyllosilicates (layered) Mica like with $[\text{Si}_4\text{O}_{10}]^{4-}$ and related groups

VIII/H.20 - Hectorite - Zincochlorite series

VIII/H.20-10 Hectorite $\text{Na}_0.3(\text{Mg,Li})_3\text{Si}_4\text{O}_{10}(\text{OH})_2 \cdot 2\text{H}_2\text{O}$ C 2/m 2/m

VIII/H.20-20 Saponite $[\text{Ca}/2,\text{Na}]_0.3(\text{Mg,Fe})_3(\text{Si,Al})_4\text{O}_{10}(\text{OH})_2 \cdot 4(\text{H}_2\text{O})$ C 2/m 2/m

VIII/H.20-30 Spodumene $\text{MgSiO}_2(\text{OH})_2 \cdot (\text{H}_2\text{O})$ (?) None

VIII/H.20-40 Stilwellite $[\text{Ca}_0.5,\text{Na}]_0.33(\text{Mg,Fe})_3\text{Si}_4\text{O}_{10}(\text{OH})_2 \cdot n(\text{H}_2\text{O})$ Unk (ORTH ?) Mono

VIII/H.20-50 Sauconite $\text{Na}_0.3\text{Zn}_3(\text{Si,Al})_4\text{O}_{10}(\text{OH})_2 \cdot 4(\text{H}_2\text{O})$ C 2/m 2/m

VIII/H.20-60 Zincochlorite $\text{Zn}_3\text{Si}_4\text{O}_{10}(\text{OH})_2 \cdot 4(\text{H}_2\text{O})$ (?) C 2/m ? 2/m

Other Saponite Information

☒ **References:**

NAME(Duda&Rej190) PHYS. PROP.(Enc. of Minerals,2nd ed.,1990) OPTIC PROP.(Ford32)

☒ **See Also:**

Links to other databases for Saponite :

1 - Alkali-Nuts(English) 2 - Alkali-Nuts(Francais) 3 -Athena 4 - Crocoite.com Mineral Locations 5 - EUROMin Project 6 -Google Images 7 -Handbook of Mineralogy 8 -MinDAT 9 -MinMax (Deutsch) 10 -MinMax(English) 11 - Minerals of Wisconsin 12 - École des Mines de Paris

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Ask-A-Mineralogist from the Mineralogical Society of America
Mindat.org's Discussion Groups
Original Rockhounds Discussion Group
Rockhounds Discussion Group on Yahoo Groups

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